ABSTRACT

Provided is a reliable semiconductor device with a layered interconnect structure that may develop no trouble of voids and interconnect breakdowns, in which the layered interconnect structure comprises a conductor film and a neighboring film as so layered on a semiconductor substrate that the neighboring film is contacted with the conductor film. In the device, the materials for the conductor film and the neighboring film are so selected that the difference between the short side, a_p, of the rectangular unit cells that constitute the plane with minimum free energy of the conductor film and the short side, a_n, of the rectangular unit cells that constitute the plane with minimum free energy of the neighboring film, $\{|a_p - a_n|/a_p\} \times 100 = A$ (%) and the difference between the long side, b_p, of the rectangular unit cells that constitute the plane with minimum free energy of the conductor film and the long side, b_n, of the rectangular unit cells that constitute the plane with minimum free energy of the neighboring film, $\{|b_p - b_n|/b_p\} \times 100 = B$ (%) satisfy an inequality of $\{A + B \times (a_p/b_p)\} < 13$. In this, the diffusion of the conductor film is retarded.

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